Ultra-Bright Ultra-High-Resolution Reality Center

Chair's Prerogative Exhibit

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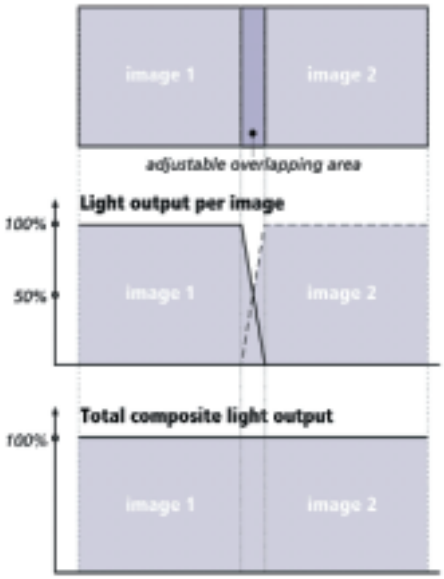
The Ultra-Bright Ultra-High-Resolution Reality Center demonstrates the latest developments in simulation-based digital light-valve projection technology. The goal is to provide an insight into the future of light-valve projection technologies and their use in high-end, multi-channel projected displays.

Since the first multi-channel, curved-screen Reality Center was installed in Reading, England, in 1994, CRT technology has been utilized almost exclusively as the projection source, primarily because several simulation-based modifications are required for high-end, multi-channel, curved-screen displays, and only CRT projectors have been able to deliver these technologies.

In contrast to the historical norm, this Reality Center installation employs extremely bright high-resolution LCD projectors modified with many of these same simulation-based optimizations that, in the past, have been applied only to CRT projection technology. This high-tech marriage obviates the need to limit ambient light and creates a Reality Center without walls, opening up multi-channel, curved-screen displays to larger audiences and greater collaboration than was previously possible.

Much of the technology demonstrated here represents prototype-stage developments from the R&D department of BARCO Simulation Products. Some of the advancements (such as True Motion Reproduction, Transport Delay Reduction, Color Gamut Matching, and Micro Lens Array options) are available commercially in a mature form. However, several other optimizations that are implemented in this Reality Center (such as the Advanced Geometry Correction and Optical Soft-Edge Matching) represent truly emerging technologies. Each is revealed in its current preliminary version, and each is still in development for eventual commercial applications.

The Advanced Geometry Correction implemented for SIGGRAPH 2001 (called "Warp6" by BARCO Simulation Products) enables electronic generation of complex distortions without any frame delay. Warp6 is implemented within each LCD projector to conform the image data so that the image appears undistorted on a curved screen. Optical Soft-Edge Blending enables this multi-channel display to have a single seamless display between channels. This edge blending is accomplished within the projector's optical path to reduce the black level in the overlap zone while maintaining a full dynamic range.



Optical Soft-Edge blending is achieved by modulation of the light output in the overlap zone so that the total light output in that zone equals the light output of the rest of the image.

WARP 6 is a non-linear image mapping processor in SXGA resolution. It is optimized to preserve fine detail in the image and reduce aliasing to an absolute minimum, using bi-cubic interpolation algorithms and a highly advanced processor board.